

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A system for high throughput detection of genotypes comprising  
[[;]]  
a sample preparation automation system;  
a sample tracking system;  
an automated high density probe array loader;  
a plurality of high density nucleic acid probe arrays;  
a vacuum-assisted wash station for removing non-hybridized nucleic acids in  
fluid communication with the arrays; and  
a computer system for managing hybridization data and for analyzing  
hybridization data to determine the genotype of a sample.
2. (Previously Presented) The system of claim 1 wherein the sample preparation automation  
system is a robotic device for handling multiwell plates.
3. (Original) The system of claim 1 wherein the sample tracking system is a bar code  
system.
4. (Previously Presented) The system of claim 1 wherein the computer system comprises a  
processor; and a memory coupled with the processor, the memory storing a plurality of  
machine instructions that cause the processor to perform the step of analyzing the  
hybridization data to determine the genotype of a sample at a plurality of single  
nucleotide positions in a region of interest.
- 5-16. (Canceled)
17. (Previously Presented) The system of Claim 1 wherein the sample tracking system and  
the computer system are linked.
- 18-20. (Canceled)

21. (Previously Presented) The system of claim 1 wherein said probe arrays have feature sizes of about 20 x 24 microns or smaller.
22. (Previously Presented) The system of claim 21 wherein each high density nucleic acid probe array is capable of simultaneous screening of 30 kilobases of sense nucleic acid sequence and 30 kilobases of antisense nucleic acid sequence.
23. (Previously Presented) The system of claim 1 wherein the high density nucleic acid probe arrays are resequencing or variation detection arrays.
24. (Currently Amended) The system of claim 1 wherein the high density nucleic acid probe arrays are capable of genotyping ~~genotype~~ a plurality of single nucleotide polymorphisms.
25. (Currently Amended) The system of claim 1 wherein ~~a contiguous sequence is tiled on~~ the high density nucleic acid probe arrays include a tiled contiguous sequence.
26. (Previously Presented) The system of claim 1 wherein the sample tracking system comprises a single or multiple dimensional barcode system.
27. (Previously Presented) The system of claim 1 wherein the sample tracking system comprises an electromagnetic encoding system.
28. (Currently Amended) The system of claim 1 wherein the sample preparation automation system is capable of long range polymerase chain reaction amplification of a plurality of nucleic acid samples, ~~thereby obtaining~~ to obtain amplicons.
29. (Previously Presented) The system of claim 28 wherein the amplicons obtained after long range polymerase chain reaction amplification are from 3 kilobases to 15 kilobases.

30. (Previously Presented) The system of claim 28 wherein the sample preparation automation system is capable of reverse transcribing each nucleic acid sample to obtain cDNA prior to long range polymerase chain reaction amplification.
31. (Previously Presented) The system of claim 1 wherein the automated high density probe array loader further comprises a refrigerated unit.
32. (Previously Presented) The system of claim 1, wherein each array comprises 400,000 different sequence probes, wherein each probe is present in a different feature of the array.